

polymerization initiator, in which a polystyrene-conversion weight average molecular weight through a gel permeation chromatography is 4.0×10^5 - 3.0×10^6 and a bound styrene content is 10-50 mass% and a vinyl bond content in butadiene portion is 20-70%, with 10-200 parts by mass of a hydrogenated styrene-isoprene copolymer (B) based on 100 parts by mass of the copolymer (A), in which a polystyrene-conversion weight average molecular weight through a gel permeation chromatography is 5.0×10^3 - 2.0×10^5 and a bound styrene content is 25-70 mass% and not less than 60% of double bond in isoprene portion is hydrogenated. The rubber composition has a relation between the bound styrene content of the polymer (A) and the bound styrene content of the polymer (B), satisfying the following equation: bound styrene content of polymer (B) > bound styrene content of polymer (A) + 10 (mass%).

Claim 1 recites that the styrene-isoprene copolymer (B) has a polystyrene-conversion weight average molecular weight of 5.0×10^3 - 2.0×10^5 . As acknowledged by the Patent Office at page 3, lines 5-6, Parker does not disclose a weight average molecular weight for either (A) or (B) components, as recited in Claim 1. However, Takino also does not disclose a weight average molecular weight for either (A) or (B) components, as recited in Claim 1. It is generally known that the polymer having such a molecular weight range has an oil-like nature. There is nothing in the specifications of Parker or Takino that would suggest the weight average molecular weight of the (A) or (B) components or their properties. Further, neither Parker or Takino teach or suggest the application of the polymer having this particular range of molecular weight in a rubber composition. Moreover, the Patent Office has failed to identify any suggestion or motivation in either of the references that would render obvious this feature recited in Claim 1.

Next, Claim 1 recites compounding a styrene-butadiene copolymer (A) polymerized with

a lithium based polymerization initiator. Neither Parker nor Takino teach this feature of Claim 1. Moreover, a lithium based polymerization initiator, as recited in Claim 1, is a solution polymerization. Therefore, the fact that Parker teaches that the styrene-butadiene copolymer is formed by emulsion polymerization does not teach or suggest a lithium based polymerization (solution polymerization), as recited in Claim 1. Furthermore, the Patent Office has failed to identify any suggestion or motivation in either of the references that would render this feature of Claim 1 obvious over Takino or Parker.

Further, to obtain the compatibility between the copolymer (A) and the copolymer (B), Claim 1 teaches that the relation of styrene content of copolymer (B) is greater than the styrene content of copolymer (A) + 10 (mass%) (*see also* specification at page 6, second paragraph). Takino discloses a combination of styrene-butadiene and styrene-isoprene, wherein the styrene content of styrene-isoprene rubber is higher than that in the styrene-butadiene rubber, but such a combination is defined to have two-peak $\tan\delta$ (*see* Abstract; col. 3, ll. 63-66). That is, the fact that the rubber composition has two-peak $\tan\delta$ indicates that the two polymers are not compatible with each other. In this regard, Takino teaches that “Having two peaks of $\tan\delta$, the rubber composition of the present invention permits the individual rubber components to exhibit their own characteristic properties” (col. 3, ll. 63-66).

Therefore, as neither Takino or Parker teach or suggest the features of Claim 1, the references fail to render obvious Claim 1. For at least the same reasons Claim 1 is patentable over the prior art, dependent Claims 2-9 are patentable over Takino and Parker. In light of the above, withdrawal of the rejection of Claims 1-9 is respectfully requested.

RESPONSE UNDER 37 C.F.R. § 1.111
U.S. Application No. 10/522,381

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In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Kim E. Choate
Registration No. 57,102

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

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